# Saber Electrical System Designer

## Quickly and reliably design and verify vehicle electrical systems
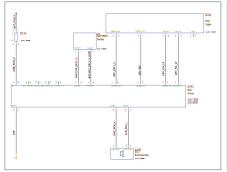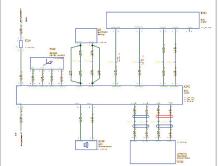
## Overview

Vehicle electrical systems distribute power and data amongst electrical subsystems and components enabling safe, efficient, and cost-effective vehicle operation. With its myriad of complexities and interdependencies on all connected sub-systems, the electrical system design process poses significant technical and logistical challenges to make it function reliably.

SaberES Designer™ enables design teams to address these challenges by providing an integrated process for electrical system design from concept to manufacturing. SaberES Designer minimizes data entry, manages complex, system-wide design variants, enables concurrent engineering, maintains data integrity, and allows efficient exchange with 3D CAD systems.

## SaberES Designer is the Only Completely Unified Tool for Electric System Design and Verification

- Intuitive tool for developing functional and physical electrical system designs
- Integrated data flow for electrical system design from concept to manufacturing
- Single database ensures correct by construction and eliminates data translation errors
- Robust sheet check-in/check-out for efficient concurrent engineering
- Built-in and extensible design verification



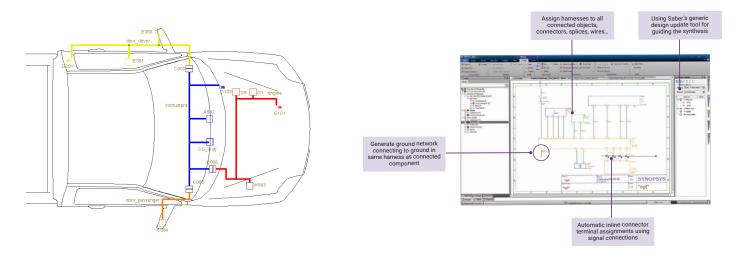SaberES Designer functional and physical designs
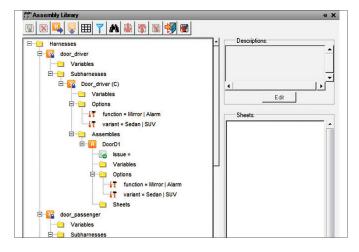
# Functional and Physical Electrical System Design

- Create component symbols and save to Parts Library for reuse
- Design functional subsystems by connecting symbols with logical signals
- Place functional subsystems from the Subsystem Library to create whole vehicle electrical system designs
- Filter/exclude variant dependent functionality from sub-systems
- Generate wiring designs from functional system designs
- Assign physical attributes from corporate database including: wires, shells, inline connectors, splices, etc.
- Use Shell Viewer to quickly ensure correct inline cavity occupation
- Use Automatic Parts Selector to determine required passive components for each connector shell and cavity
- Check basic design rules for disconnected wires or missing properties for shells, splices, wires, etc.
- Use Harness Architecture to add physical vehicle architecture to your design, adding synthesis to the design integration



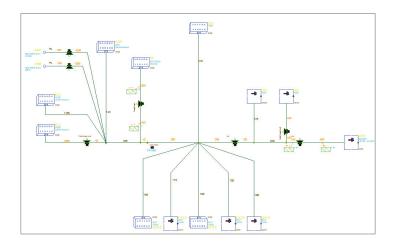Harness architecture design and design synthesis

# Variant Handling and Filtering

- Generate 150% wiring designs for electrical systems with different variations
- Assign feature options to components and wires in wiring designs
- Use Assembly Library to graphically select feature options and generate variant-dependent buildable harnesses



SaberES Designer assembly library

# Harness Design

- Easily export wiring design data to 3D MCAD tools
- Conversely, import placement and routing data from 3D MCAD tools
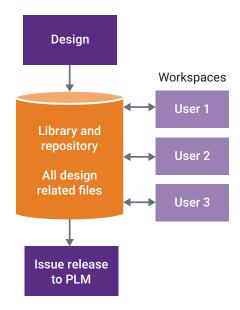- Use SaberES Designer Table Manager to quickly generate ASCII files for custom export, like bill of material tables



Bundle design

## Generated Drawings

- Generate wire harnesses from connectivity, wiring design, and variant information
- Set connector symbol position and define desired harness segment routings
- Reuse geometrical information, such as length, from the 3D MCAD tools
- Project 3D information from 3D MCAD tools in 2D drawing
- Select viewing perspective, rotation, and scale of the projection

# Concurrent Engineering

- Optimize engineering investments by spreading design tasks across different sites
- Check-in/check-out design sheets to eliminate data integrity issues

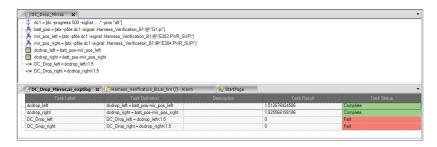

SaberES Designer on-design database

## Correct by Design

- Avoid conflicts and eliminate synchronization and merging tasks by working from a single design database
- Auto generate bill of materials from same database used for electrical system design and verification

## Verification of Electrical Systems

### Voltage Drop and Over-current

- Implement reusable verification simulations using SaberES Designer Experiment Analyzer
- Use built-in DC simulation capabilities to verify voltage drop and overcurrent to determine fuse sizes, cross-sectional areas of all wires, existence of sneak paths, etc.
- Back-annotate simulation data and probe critical nodes to quickly identify problem areas



Simulation experiment

### Advanced Transient and Robust Design

- Add optional Saber Simulator for transient verification of high-speed systems including vehicle networks
- Add optional Saber Inspecs to optimize the design for component variations and shifts in operating conditions

### Functional Safety

- Add optional Saber Functional Safety to verify functional safety of electrical systems
- Quickly select and configure hardware faults directly from the SaberES Designer wiring design
- Export functional safety simulation results From SaberES Designer Experiment Analyzer to document fault coverage and support functional safety flows

## Supported Operating Platforms

- Windows 7
- Windows 8
- Windows 10

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